CLAIMS

1 1.   A filter comprising a plurality of interconnected modular basic units, and a delay line

2 equipped with takeoff points to furnish delayed sampling values (x1, ..., xN; xi) of a digital signal

3 (x), such that the delay times of the sampling values are integer multiples, and in particular even

4 integer multiples n of the period with n = 0, 1, 2, 3, ... of a sampling clock pulse coupled to the

5 digital signal (x),

6   each basic unit contains a programmable weighting device, a linkage device, and a delay

7 device, which delays the data conducted to it by a single period (T) of the sampling clock pulse or

8 by a simple integer multiple thereof, and

9   the filter further contains a programmable control device, which switches over or switches

10 off a part, especially half, of the data inputs of the basic unit to achieve forward and/or backward

11 filtering   and/or   sign   inversion   and/or   a   change   of   the   active   filter   length.

1 2.   The filter of claim 1, characterized in that the programmable control device comprises a

2 first switching device, which, in dependence on a first control signal (F), couples a part, especially

3 half, of the data inputs of the interconnected modular basic units either to the delay line or to the

4 interconnected modular basic units.

1 3.   The filter of claim 1, characterized in that the programmable control device comprises a

2 second switching device, which, in dependence on a second control signal (P), switches into an

3 ineffective state especially a last stage (N) of the delay line and/or a data input, especially the one

4   of the last stage (N) of the interconnected modular basic units.

1   4.   The filter of claim 3, characterized in that the programmable control device comprises a

2   sign inverter, which, in dependence on a third control signal (I), inverts the signs of the data

3   values passed through it, which are conducted to the associated data inputs of the interconnected

4   modular   basic   units.

1   5.   The filter of claim 4, characterized in that the programmable weighting device comprises a

2   multiplier, to whose first input a coefficient (c) is conducted and to whose second input a data

3   value to be weighted is conducted, the coefficient (c) being programmable and being stored in a

4   register.

1   6.   The filter of claim 5, characterized in that the linkage device comprises a first adder, whose

2   first and second input is coupled to a first and second data input of the basic unit, and whose

3   output is coupled to the second input of the multiplier.

1   7.   The filter of claim 6, characterized in that the respective first data input of the modular

2   interconnected basic units are supplied with the delayed sampling values ($x1, ..., xN$) in sequential

3   time order, and the respective second data inputs are supplied essentially uniformly with a single

4   data value, which is coupled to the delay line, when the first switching device is in a first switch

5   position (F1), and is coupled to at least one data output of the modular interconnected basic units,

6   when said first switching device is in a second switching position (F0).

1   8.   The filter of claim 7, characterized in that the linkage device comprises a second adder,

2 whose first and second input are coupled to a third data input of the basic unit and to the output of

3 the multiplier, and whose output is coupled to the input of the delay device, the third data input

4 being used to accept an output data value of the preceding basic unit, and the output of the delay

5 line being connected to a data output of the basic unit.

1 9. The filter of claim 8, characterized in that the registers of the modular interconnected basic

2 units are linked to one another like a shift register through a coefficient input and a coefficient

3 output, so as to write the coefficients (c) serially into the registers.

1 10. The filter of claim 9, characterized in that the number of existing functional units in the

2 basic units, especially at the beginning and/or end of the modular interconnected basic units, is

3 reduced, whereby modified basic units result.